TO STRAP OR NOT TO STRAP?

The BRANZ Helpline regularly receives enquiries about when strapping must be used to tie the timber framing together. These tips should point you in the right direction.

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NZS 3604:2011 Table 2.2 is a guide for nailing requirements and describes the types and capacity of fixings. Five of the fixing types include galvanised mild-steel strapping (see Table 1).

Roof frame strapping

Most strapping requirements are for roof framing (see Figure 1). In strong winds, this is the most vulnerable part of the structure as it is subject to uplift. Where a roof is supported over an opening, it is essential that the load is transferred around the opening.

LINTELS

NZS 3604:2011 paragraphs 8.6.1.7 and 8.6.1.8 require that, where a lintel supports a rafter or truss, and depending on wind zone, lintel span and loaded dimension, the lintel must be fixed against uplift according to Table 8.14. This includes using 25 × 1 mm galvanised steel straps meeting the capacity requirements in Table 8.18 to secure the lintel to the trimming stud and the trimming stud to a floor joist or solid blocking (Figure 8.12). Each strap must be fixed by six 30 × 2.5 mm nails into both the lintel and the trimming stud.

Tying down is also required between the:

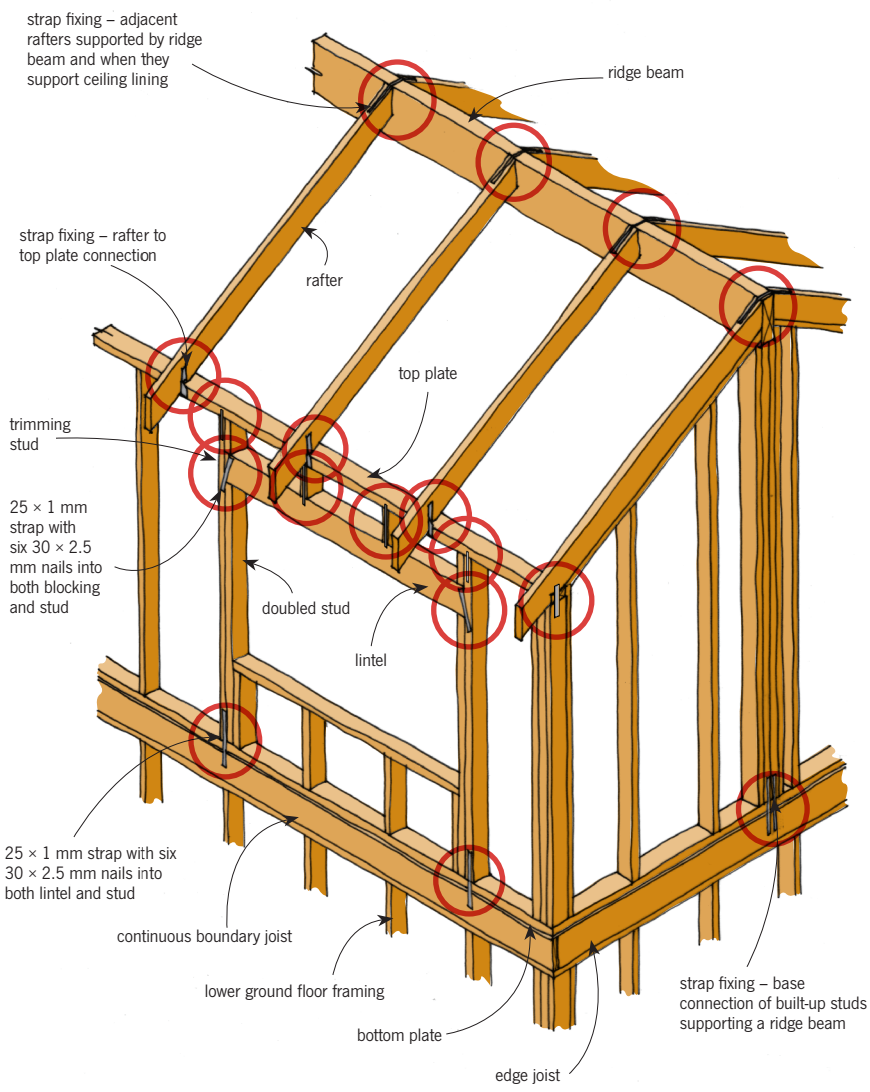
- top plate and lintel
- top plate and jack studs
- trimming studs to top plate.

An alternative 7.5 kN connection (in tension) may also be used.

TRIMMING STUDS

Fixing the trimming stud to the floor joist applies to a single-storey building or to upper floor framing to the intermediate floor.

Where ground floor framing is on a concrete floor slab, the strapping is folded under the bottom plate and fixed to each side of the stud using six 30 × 2.5 mm nails (see Figure 2).



Note: Circles indicate strap fixing locations to resist uplift.

Figure 1: Framing locations requiring strap fixing.

A proprietary anchor or cast-in bolt must fix the bottom plate to the slab within 150 mm of the stud.

DON'T FORGET THE REST

Other locations where strapping of roofs is required are shown in Figure 1 and include:

- rafter to top plate connections (NZS 3604:2011 paragraph 10.2.1.3.7(a) and Figure 10.6)
- truss to top plate connections (NZS 3604: 2011 paragraph 10.2.2.6, Figure 10.21 and Tables 10.14 and 10.15) – may be straps and/or wire dogs
- over adjacent rafters supported by a ridge beam and when they support the ceiling lining (NZS 3604: 10.2.1.3.7(b) and Figures 10.5 and 10.7)
- dummy rafters over sarking or ceiling lining and supporting purlins (NZS 3604: 10.2.1.17.2, Figure 10.20 and Table 10.13)
- timber members connecting a top plate and a parallel floor or roof framing member to provide lateral support (NZS 3604: 8.7.4.1 and Figure 8.17).

Wall framing strapping

Wall framing strapping is required:

- at the base connection of built-up studs supporting a ridge beam (NZS 3604: 2011 paragraph 10.2.1.5.2, Figure 8.12 and requirements of Table 10.2) – see Figure 1
- at ends of some bracing wall elements in accordance with bracing panel manufacturers' fixing instructions.

Table 1: NZS 3604:2011 fixing types that include steel strapping (from NZS 3604:2011 Table 2.2).

Fixing type	Description	Figure in NZS 3604:2011
C	two 90 × 3.15 mm end nails and strap fixing	8.12
D	four 90 × 3.15 mm end nails and two strap fixing	
F	two 90 × 3.15 mm skew nails and strap fixing	10.6
P	two HDG 'flat' straps	9.3 (b)
Q	two HDG 'tee' straps	9.3 (a)

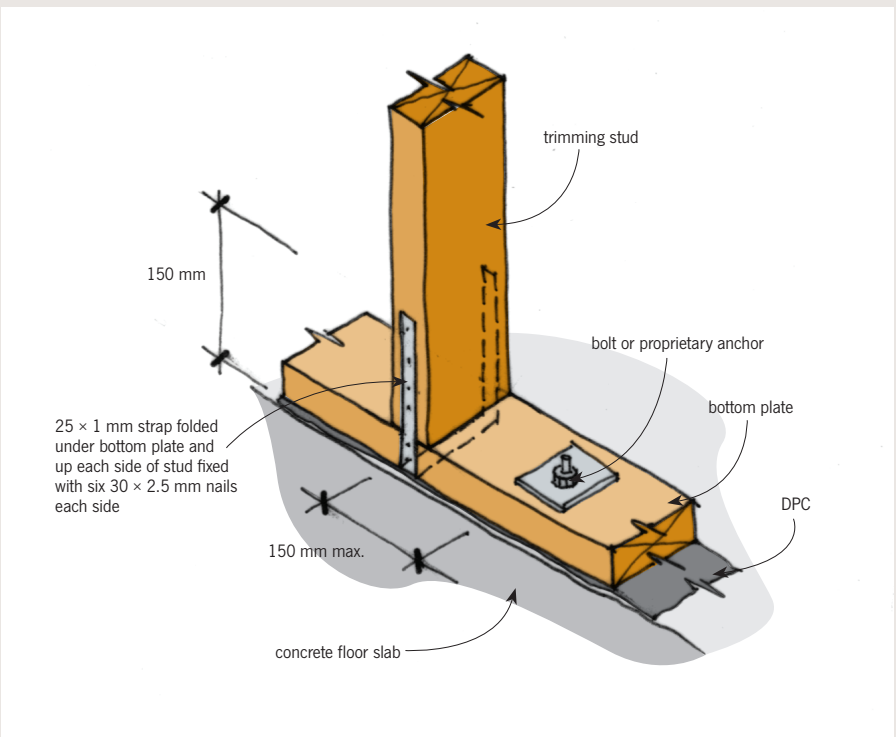


Figure 2: Fixing the trimming stud to the bottom plate on a concrete floor slab.